

What is claimed is:

1. An optical transmission system, comprising:
  - a transmitter transmitting a WDM optical signal including variable number of channels associated with different wavelengths; and,
  - an optical amplifier which amplifies the WDM optical signal,
  - the optical amplifier including a controller having a transient mode in which the optical amplifier is controlled to amplify the WDM optical signal with an approximately constant gain, and a normal mode in which the optical amplifier is controlled to output the amplified optical signal with a predetermined level, the controller being operable in the transient mode when the number of channels is being varied.